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A New Species of *Asymmetrione* (Isopoda: Bopyridae) Infesting the Hermit Crab *Isocheles pilosus* (Holmes) in Southern California

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Abstract.—A new species of *Asymmetrione* (Isopoda: Bopyridae) infesting the hermit crab *Isocheles pilosus* (Holmes) in southern California by John C. Markham. *Bull. Southern California Acad. Sci.*, 84(2):104–108, 1985. The new species *Asymmetrione ambodistorta* is described and figured. It belongs among those species of *Asymmetrione* whose females are distorted relatively little, but is unique in the genus for having females distorted in both directions, hence its specific name. *Asymmetrione ambodistorta* is the first species of *Asymmetrione* to be described from the eastern Pacific Ocean.

Recently, Dr. F. G. Hochberg of the Santa Barbara Museum of Natural History (SBMNH) made available for study several specimens of bopyrid isopods housed in the collection of that museum. One series of four pairs is of particular interest in that it represents a new species of the genus *Asymmetrione,* the first such available for description from the eastern Pacific, the first such known to occur in both dextral and sinistral forms, and the first bopyrid of any genus recorded as a parasite of a species of the diogenid hermit crab genus *Isocheles.*

Asymmetrione ambodistorta n. sp.
Figures 1, 2

Material examined.—One female, holotype, SBMNH 33893; one male, allotype, SBMNH 33894, three females, three males, paratypes, SBMNH 33895. Infesting *Isocheles pilosus* (Holmes) (Anomura: Diogenidae), collected and determined by Andrea Braly, Newport Beach, Corona del Mar State Beach, California, depth ca. 3 m, 2 June 1982.

Description.—HOLOTYPE, female (Fig. 1). Length 5.42 mm, maximal width 3.56 mm, head length 1.44 mm, head width 1.44 mm, pleon length 1.29 mm. Body distortion 30°, sinistral. All body regions and segments distinct (Fig. 1A, B).

Head subcircular: Large frontal lamina irregularly four-lobed, extending far out from dorsal surface and beyond both sides of head. Antennae (Fig. 1C, D) well developed and evidently nonsetose, first of three articles, second of five, each article successively smaller proximally. Eyes absent. Posteroventral border (Fig. 1E) with lateral projection and irregularly shaped and toothed lobes on each side. Maxilliped (Fig. 1F, G) subelliptical, completely lacking palp and with only tiny nonextending spur.

Pereomeres irregularly shaped both laterally and transversely; small faint indentations on both sides of dorsal surfaces of first five pereomers; coxal plates prominent on both sides of pereomeres 1–4; sides of pereomeres 5–7 on convex side produced into separated slender points sharply reflexed back over dorsal

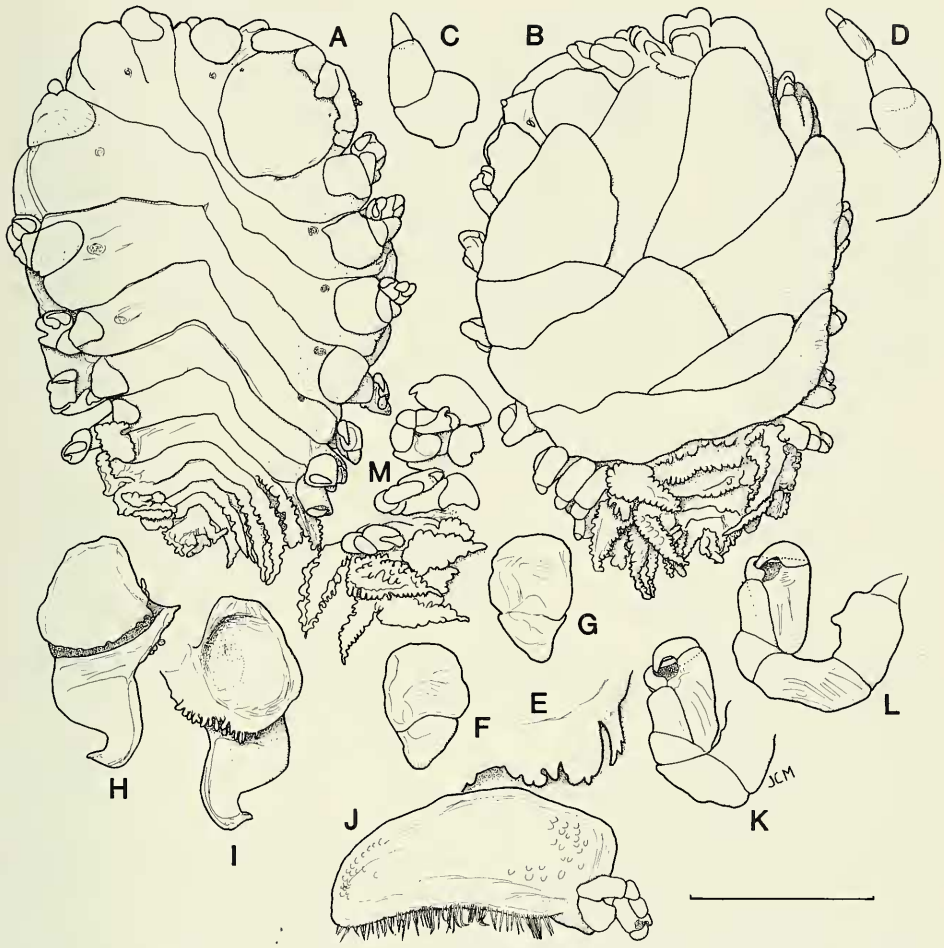

Fig. 1. *Asymmetrione ambodistorta* n. sp., holotype, female: A. dorsal; B. ventral; C. right antenna 1; D. right antenna 2; E. left posteroventral border of head; F. left maxilliped external; G. same, internal; H. left oostegite 1, external; I. same, internal; J. right oostegite 5; K. left pereopod 1; L. left pereopod 7; M. left pereopods 5–7, pleopods 1, 2, lateral view; Scale: 2.0 mm for A, B, F–J, M; 1.0 mm for E, K, L; 0.55 mm for C, D.

surfaces (Fig. 1A, M). Oostegites completely enclosing brood pouch; oostegite 1 (Fig. 1H, I) nearly twice as long as broad, ending in sharply curved falcate point; outer groove deep and conspicuous, inner ridge bearing many slender lobes. Oostegite 5 (Fig. 1J) subrectangular, with partly tuberculate surface and dense fringe of posterior setae. Pereopods (Fig. 1K, L) all of same structure, somewhat larger posteriorly, especially on concave side; all with deep propodal sockets to receive dactyl tips; bases variously carinate.

Pleomeres all chevron-shaped dorsally, their convex margins forward; posterior margins of most pleomeres scalloped ventrally. Each side of pleomeres 1–5 produced into dentate-margined lanceolate lateral plate and bearing similarly biramous pleopods (Fig. 1M). Pair of similar biramous uropods on pleomere 6. Mid-

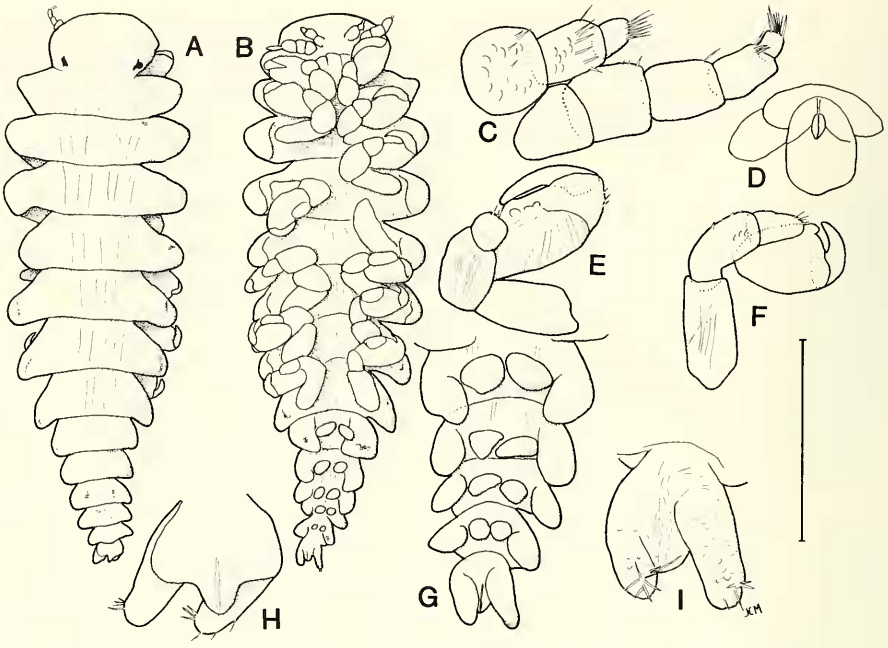

Fig. 2. *Asymmetrione ambodistorta* n. sp., allotype, male: A. dorsal; B. ventral; C. left antennae; D. mouth; E. left pereopod 1; F. left pereopod 7; G. pleon, ventral; H. last pleomere, dorsal; I. same, ventral; Scale: 1.0 mm for A, B; 0.4 mm for E, G; 0.2 mm for C, D, H, I.

ventral region of pleon not covered by appendages, serving as area of attachment for male.

ALLOTYPE, male (Fig. 2): Length 2.76 mm, maximal width 0.91 mm, head length 0.34 mm, head width 0.55 mm, pleon length 0.75 mm. Head and pereon dorsally fused, but all body regions and segments otherwise distinct (Fig. 2A, B). Some small pigment spots near sides of dorsal surfaces of several segments.

Head transversely oval, almost straight across front. Eyes small and dark, near posterolateral margins. Antennae (Fig. 2C) of three and five articles, respectively, each with many setae distally and some setae on nearly all other articles. Mouth (Fig. 2D) reduced.

Pereon broadest, but not markedly so, across pereomeres 2 and 3, though pereomeres 6 and 7 notably narrower than preceeding ones. All pereomeres broadest posteriorly, tapering forward to leave lateral notches along both sides of body. Pereopods all of about same size but propodi and dactyli of first two pairs proportionately larger than others (Fig. 2E, F); merus and ischium of each evidently fused, as each pereopod of only five articles; carpus of each distally setose, and some setae also scattered elsewhere; surface of propodus of first pereopod (Fig. 2E) with aligned tubercles forming groove to receive dactylus; most propodi obliquely ridged near distal ends.

Pleon evenly tapered posteriorly, pleomeres similar in shape to pereomeres but much narrower. Lateral margins of all pleomeres sharply reflexed laterally and posteriorly (Fig. 2G). Five pairs of flaplike pleopods extending slightly from pleomeral surfaces (Fig. 2G). Final (sixth) pleomere (Fig. 2H, I) extended midposter-

iorly into anal cone and produced ventrally into large extended uropods, each with rosette of setae positioned subdistally.

PARATYPES, females: Two sinistral, one dextral. Lengths 4.32 to 5.08 mm. Distortion up to 50°. One maxilliped with slightly more extended spur. Most first oostegites with fewer and larger lobes on internal ridges; some fifth oostegites more pointed and less tuberculate. Appendages of one pleon difficult to interpret, bunched together.

PARATYPES, males: Length 2.40 to 2.64 mm, widths 0.82 to 0.92 mm. No noteworthy structural differences from allotype, but one specimen with abundant dorsolateral pigmentation.

Etymology.—The name *ambodistorta* meaning "both distorted" has been selected to refer to the occurrence of both dextral and sinistral forms in the females of this species, a situation otherwise unknown in the genus *Asymmetrione.*

Discussion

The genus *Asymmetrione* was established by Codreanu, Codreanu, and Pike (1965) to contain a Japanese hermit-crab infesting parasite originally described as *Pseudione asymmetrica* by Shiino (1933) and a closely similar species from the Red Sea. Bourdon (1968) created the genus *Megachelione* for a new species in the western Mediterranean, *M. foresti,* which is similar to other species of *Asymmetrione* but its female is much less distorted. At the same time, Bourdon (1968) described another species which he assigned to *Asymmetrione.* Markham (1975) described two western Atlantic species, incorporated *Megachelione* into *Asymmetrione,* and reviewed the genus *Asymmetrione,* then known to contain six described and two undescribed species. Bourdon (1976) described another species and further reviewed the genus in a paper prepared too early for a consideration of the combination of genera. Markham (1975) noted that all of the highly distorted females (belonging to *Asymmetrione, s. s.*) are dextral or bent so that their right sides are the longer (="convex") and occupying the right gill chambers of their hosts. The less distorted females (of the *Megachelione* type) are all sinistral. Aside from the direction and amount of distortion of their females, all species seem clearly assignable to a single genus. Bourdon (1976), while not considering whether *Megachelione* belongs in *Asymmetrione,* did recognize that all of the highly distorted (typically to 100°) females were known to be dextral and designated their species "*Asymmetrione* dextres." Both dextral and sinistral forms are common within the Bopyridae, and in most species both forms, as mirror images, occur in about equal numbers. Only in a very few cases are species known exclusively in one form or the other.

Asymmetrione ambodistorta is clearly one of the less distorted species of the genus. As its name indicates, it occurs in both forms, a situation unique for any species of *Asymmetrione,* three females being sinistral and one dextral. It illustrates well all of the characters of the genus: female with very prominent lobate frontal lamina, large pereopodal propodi with "sockets" for dactyli, first oostegites with sharply tapered point and lobed internal ridge and biramous lanceolate pleopods and uropods; male long and slender with head usually dorsally fused with pereon, all segments set apart laterally, flaplike pleopods and large extended posterior lobes or uropods. The female of *A. ambodistorta* is relatively little distorted and mainly sinistral. These characters ally it with two other species of *Asymmetrione,*

namely *A. foresti* (Bourdon, 1968) and *A. desultor* Markham, 1975. Both sexes are most similar to those of *A. foresti,* a parasite of the diogenid hermit crab *Paguristes occulatus* Fabricius in the northwestern Mediterranean. The female of *A. ambodistorta* is different from that of *A. foresti* in being more distorted, having nontuberculate pereopods and having tuberculate margins on its pleonal appendages. The male of *A. ambodistorta,* in contrast with that of *A. foresti,* has five articles in its second antenna rather than seven, a tapered rather than nearly straight-sided pleon and relatively smaller pleomeres. The female of *A. ambodistorta* differs from all other described species of *Asymmetrione* in having depressions on the dorsolateral regions of most pereomeres and reflexed points on the convex sides of pereomeres 5 and 7. All other males of *Asymmetrione* have variously produced posterior extensions on the posterior margin of the final pleomere, which have not been interpreted as uropods; uniquely in males of *A. ambodistorta,* these projections are distinctly set off from the last pleomere, at least in dorsal view; therefore, they are here regarded as uropods.

In an earlier publication (Markham, 1975) I reported the discovery of a badly damaged female of an evidently undescribed species of *Asymmetrione* which had come from the Pacific coast of Costa Rica. That species remains undescribed, but because it is a highly distorted one, it cannot be the same as *A. ambodistorta.* Its recorded host, "*Clibanarius* sp.," could be any diogenid hermit crab found in the area.

This is the first record of a bopyrid infesting a species of *Isocheles.* Like each of the other species of *Asymmetrione,* except *A. desultor* Markham (1975) a parasite of four western Atlantic pagurids, *A. ambodistorta* is only known from a single species of diogenid hermit crab.

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